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before

Subcommittee on Energy and Resources
House of Representatives
Committee on Government Reform
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Washington, DC 20515

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AMERICA'S ENERGY NEEDS AND AMERICA'S NATIONAL SECURITY POLICY

Mr. Chairman and Members of the Sub-Committee, I am very grateful that you have given me this opportunity to present my views on a topic of enormous importance to our nation's economic wellbeing and security.

America's significant dependence on imported oil constitutes a major source of economic and security vulnerability — especially because a growing portion of US imports come from politically unstable parts of the world. But the national security problem goes beyond this; many of our friends and allies are even more dependent on imported oil than we are. They would be harmed to an even greater degree by supply disruptions; some are vulnerable to the potential use of oil by suppliers as a means of exerting political influence over them.

Producing a sound, long term US energy policy presents an enormous challenge for congress and the president. Americans appear to take energy policy seriously only when gas prices at the pump skyrocket. For example, in the mid-1970s, when the Arab oil embargo focused American's attention on US vulnerability, the country quickly learned to use oil more efficiently.

The problem is that once the shock fades, we begin buying gas-guzzlers and we pay less attention to production, conservation and efficiency, driving import dependence, energy demand and prices back up. So the pattern repeats itself: We forget about energy policy until the next crisis erupts.

Recent events should be a strong signal that we cannot afford to take oil supplies for granted. Since the 1973-1974 oil crisis, US energy policy, for the most part, has been characterized by lofty rhetoric and the absence of tough measures. Successive administrations and congresses have been unwilling to ask Americans to make sacrifices to reduce US oil dependence. The debate has been polarized between extreme environmentalists and those who believe that additional drilling for oil and the development of other hydrocarbons constitutes virtually the entire answer to the problem. Often energy legislation contains projects designed to satisfy influential political constituencies rather than serve the broader national interest.

The longer the impasse, the greater US dependence becomes. Terrorist strikes against strategic Middle East oil facilities highlight the economic and national security risks of our excessive dependence. But even without them, enormous structural imbalances in the world oil market pose a big risk to our economy and the global economy.

In every war the US has fought, Americans have been asked to sacrifice for the common good — to make compromises and, often, to pay higher taxes or go without certain benefits in the interest of the nation's security. We now are engaged in a War on Terror. America's success in this war is correctly characterized by the President as vital to our security. Yet Americans have been asked to make no sacrifices; it has been business (or rather consumption) as usual. The absence of genuine leadership and of a broad national consensus on the need for action to reduce oil dependence presents a clear and ominous threat to the well being of every American.

This would be an opportune time for the President and Congressional leaders to put the facts squarely to the American people: IF WE DO NOT MAKE MAJOR CHANGES IN US ENERGY POLICY SOON AMERICA'S DEPENDENCE WILL INCREASE AS WILL OUR VULNERABILITY TO THE IMPACT OF LARGE GLOBAL SUPPLY-DEMAND IMBALANCES AND TO POTENTIAL DISRUPTIONS IN OIL SUPPLIES.

If we are to forge a robust energy policy no one, no interest group, will get all it wants. Each will have to give up something. Conservationists and conservatives will need to stop vilifying one another and find common ground. Politically driven projects will have to be sacrificed for those of a more compelling national interest. As the respected New York Times columnist Tom Friedman has put it, we need a new coalition that marries geopolitics, energy policy and environmentalism.

Here are the hard realities:

The US possesses a very mature geological oil infrastructure, with remaining oil reserves inadequate to meet the needs of a growing economy. As such, US dependence on oil imports is rising. Such dependence is a greater challenge today than a decade ago given four developments:

1. Geopolitical tensions.

Rapid population growth, the absence of a diversified and growing economic base and lack of representative government have increased the risks to stability in several key oil-exporting regions. The risk of supply disruption now is the highest it has been since the oil embargo years of the early 1970s. We know that radical movements have targeted oil facilities in the past and are likely to do so in the future both to disrupt economies in Middle East and to discourage foreign workers from staying; successful terrorist attacks would cause spikes in the world energy price.

Moreover, while there are plenty of reserves in various parts of the world, many of them are not accessible to western investors or even local investors due to high security risks (e.g. the Western Desert of Iraq), political uncertainties (Russia) or prohibitions/restrictions on foreign investors (parts of the Middle East, Russia and Venezuela). In some regions, populist rhetoric or political sentiment limits the willingness of foreign companies to make major investments.

In some cases also, the geography of the region or regional political uncertainties, raise difficulties in building pipelines to get oil or gas to the market — e.g. in Central Asia.

A sustained period of political and economic stability is needed in a number of countries, particularly in the Middle East, before the supply-risk related to terrorist disruption subsides. Stability involves establishment of government institutions that are more representative of the underlying population, a broadening of the benefits of economic growth and education geared toward providing skills that permit kids to get productive jobs.

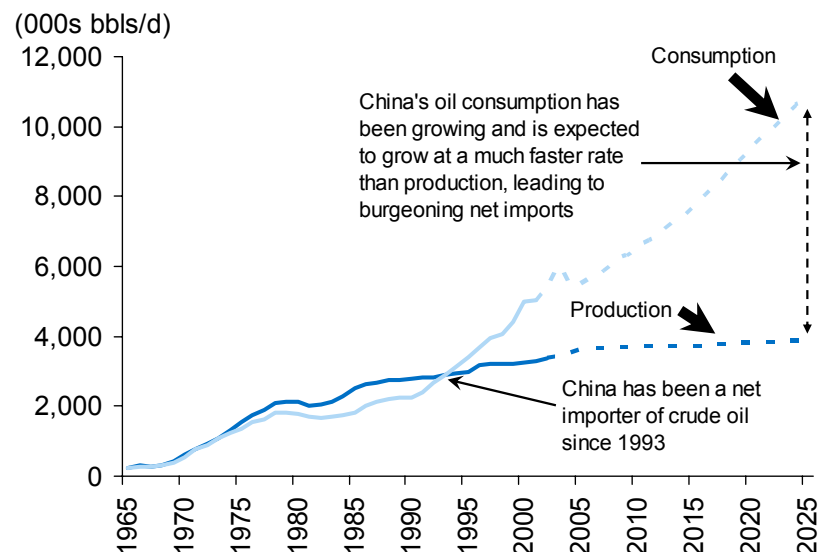
It would be reassuring if higher oil prices were seen as a path toward encouraging such reforms, but there is a tendency in some quarters to believe that high oil revenues allow governments to avoid such reforms and that payments to dissatisfied groups will lead to prolonged tranquility.

However, there are a growing number of people in the Middle East who now understand that political reform is imperative for long term stability. Elections in Iraq and the Palestinian territories have whet the appetites of the reformers for bolder action and widely watched TV broadcasts of Iraqis going to the polls led large numbers of people throughout the Arab world to wonder “Why not us?”

Some argue it is easier to accomplish reforms in a period of economic prosperity rather than one of economic stress. The period ahead will be a significant test of that theory.

2. China.

China has developed a rapidly growing thirst for oil imports given its inadequate energy resource base. And China is attempting to secure supplies of oil in Africa and Asia, which could in turn reduce supplies available to the global market. China’s challenge is compounded by the fact that shipping capacity is also in tight supply. (See graph below)



3. Limited spare capacity.

Spare capacity in crude oil, shipping, and refining markets is essentially gone. In an environment where spare crude oil capacity is minimal, the United States is dependent on oil imports and key oil-exporting countries are facing geopolitical uncertainties, US consumers and businesses should be prepared for a sustained period in which energy prices are higher in absolute terms and more volatile than the levels seen during the 1980s and 1990s.

4. Political leverage.

As oil supplies tighten, oil exporters will have greater opportunity to exert leverage over oil importers. Lest we forget, oil is a highly political commodity. Russia has a great deal of leverage over Central and Western Europe because of their significant and growing dependence on Russian oil and gas. (Russia supplies about a third of Western Europe's oil and gas requirements). Suppliers in the Middle East and elsewhere have used oil in the past for political purposes. While they are not likely to engage in 1973-74 style embargos, and given their revenue needs are not likely to take actions that do not maximize economic benefit to them, individual nations (e.g. Iran or, outside the region, Venezuela) could see a tight market and intense competition by consuming countries for supplies as an opportunity to exercise political leverage — to exert political or economic influence over individual importers.

The period ahead could witness intense economic and political competition for oil supplies — not just by China but by other nations as well — with significant geopolitical implications. For example, we are likely to witness growing tensions in Asia as Japan and China jockey for position in gaining access to and drilling in disputed oil and gas fields in coastal waters of the region. Other disputed areas could become hot spots as competition for oil/gas heats up.

PAST DISRUPTIONS

Previous episodes of high oil prices have resulted from supply shocks, and most have come from the Middle East, on which the US and the world are becoming even more dependent. (See DOE chart below)

Global Oil Supply Disruptions Since 1951

Date of Oil Supply Disruption*	Duration (Months of Supply Disruption*)	Average Gross Supply Shortfall (Million B/D)	Reason for Oil Supply Disruption
3/51-10/54	44	0.7	Iranian oil fields nationalized May 1, following months of unrest and strikes in Abadan area.
11/56-3/57	4	2.0	Suez War
12/66-3/67	3	0.7	Syrian Transit Fee Dispute
6/67-8/67	2	2.0	Six Day War
5/70-1/71	9	1.3	Libyan price controversy; damage to Tapline
4/71-8/71	5	0.6	Algerian-French nationalization struggle
3/73-5/73	2	0.5	Unrest in Lebanon; damage to transit facilities
10/73-3/74	6	2.6	October Arab-Israeli War; Arab oil embargo
4/76-5/76	2	0.3	Civil war in Lebanon; disruption to Iraqi exports
5/77	1	0.7	Damage to Saudi oil field
11/78-4/79	6	3.5	Iranian revolution
10/80-12/80	3	3.3	Outbreak of Iran-Iraq War
12/02-2/03**	3	2.1	Venezuela strikes and unrest.
3/03-8/03	6	0.3	Nigeria unrest.
3/03-9/04***	19	1.0	Iraq war and continued unrest.

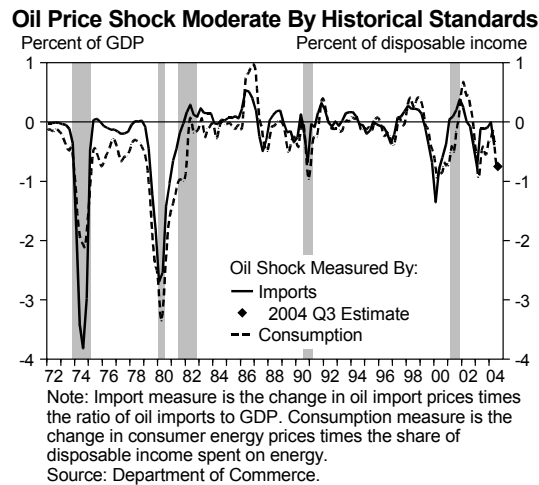
*Note: "Supply disruption" generally refers to a loss of oil from a particular country or group of countries relative to a preceding month or months. The full extent and impact of a disruption or loss depends on a variety of factors, including: a) replacement production from other, unaffected, countries; b) the level of oil inventories; and c) level and growth rate of demand. Definitions of "oil supply disruptions" are not entirely consistent from one case to the next, in part due to differing views of such events over time and amongst analysts.

**Venezuelan total oil production fell from 3.3 million barrels per day in November 2002 to under 700,000 barrels per day in January 2003, increased to 2.6 million barrels per day in March 2003, and has now stabilized at around 2.8 million barrels per day. Although Venezuelan output has not returned to pre-strike levels, for purposes of this table the "disruption" period is defined as the period between December 2002 and February 2003, when the crisis was at its peak.

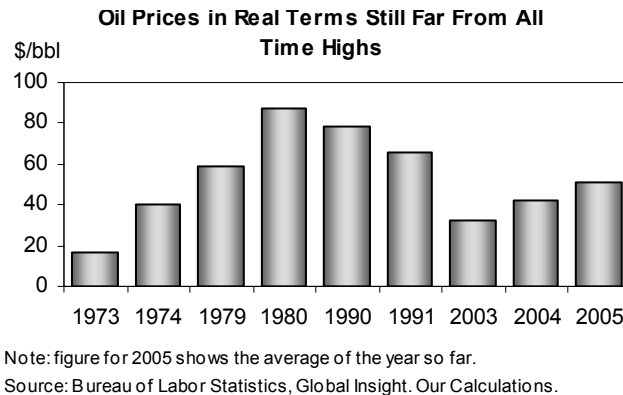
***As of September 2004, Iraqi oil output has not yet recovered to pre-war levels (2.5 million barrels per day in February 2003). In April 2004, Iraqi production reached 2.3 million barrels per day, but since then has not exceeded 2.0 million barrels per day in any month through August 2004. Due to the continued instability in Iraq, the "disruption" is considered as continuing, although certainly the peak of the losses from Iraq were experienced during the spring and summer of 2003. From April 2003 through August 2003, the oil supply disruption from Iraq averaged about 2 million barrels per day. In contrast, since the beginning of 2004, the oil supply disruption from Iraq has averaged around 0.5 million barrels per day.

ECONOMIC IMPACT

Graph A



Graph B



In contrast with the supply shock induced price increases of the past, this time the sharp price increase is primarily the result of increasing global demand for oil clashing with supply constraints that have been over a decade in the making.

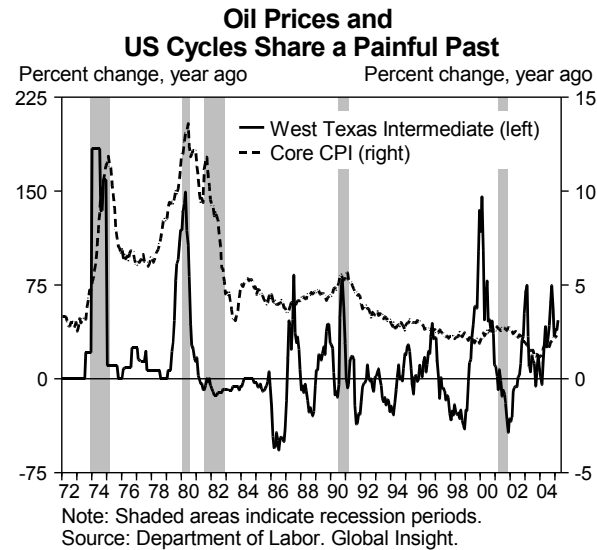
As energy prices soar, concerns about the effect on global inflation and economic growth have grown as well. So far, the price shock is smaller than those associated with most recent recessions. Two points are important here.

First, while the price of crude oil has risen sharply—about 80% over the past year and a half—this is barely on a par with the spike that occurred in 1990. (See Graph A above) It falls well short of the surges that occurred in the 1970s and is smaller, in percentage terms, than the run-up that occurred before the last recession. (See Graph B above)

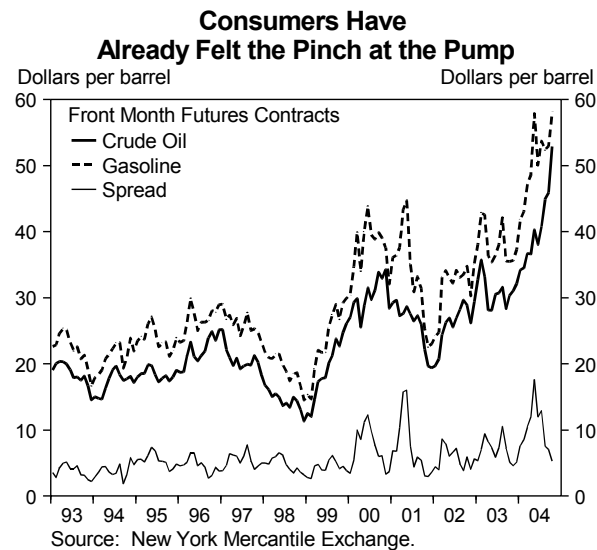
Second, the United States economy has become less dependent on oil (although not on oil imports) over time. Today it takes about half as much oil as it did 30 years ago to generate \$1 of

gross domestic product. This means that any price increase has to be correspondingly larger to wreak the same havoc on economic growth. It also means, of course, that higher prices than we have recently seen would be required to significantly curtail energy demand. (See Graph 1 below)

Graph 1



Graph 2



US consumers have already absorbed much of the recent run-up in oil prices in last year's gasoline price surge. This surge in gas prices resulted from constraints on refining capacity in the United States, which drove the "crack" spread—the difference between gasoline prices and crude oil prices—up sharply, as shown above. (See Graph 2 above)

Since then, gasoline prices have fluctuated in a range roughly consistent with the level to which oil prices have climbed lately. Although many households faced significant increases in heating

bills this winter, outlays for gasoline loom much larger in US consumer budgets. If sustained, the increase in the price of oil could shave as much as .6% off of US growth over the next 12 months and add .8% to US inflation; and it could cut .45% from G7 real GDP and boost G7 inflation by 75% — not a negligible impact, but not enough to derail the economy.

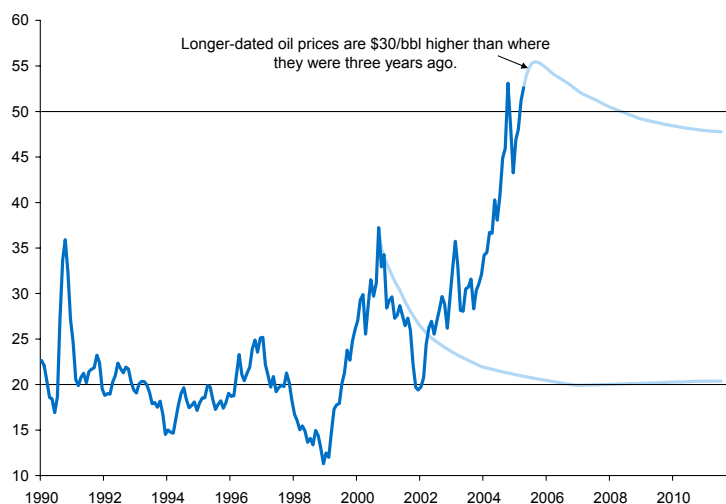
WTI oil prices bottomed in November 2001 at less than \$17.50/bbl. Oil demand in particular was reeling following September 11th. Since then, oil prices have traded higher, with nominal WTI crude oil prices surging to a record-range of \$55-\$57/bbl. The rise in prices, though persistent, has been relatively gradual in comparison to some previous spikes. The largest monthly rise in average WTI prices since early 2003 was 16% in October 2004. This is much lower than the nearly 50% spike in August 1990 or the 22% spike in September 1990 — and significantly lower than the spikes seen in the 1970s. The fact that oil prices have not spiked as suddenly as previous episodes may make the pressure easier to absorb.

Recent rises in oil prices are less a story of supply disruptions and more a combination of strong demand against the backdrop of tight supply and rising marginal costs. Arguably these may be less damaging than the classic supply shocks of the last three decades.

It is also important to put aside the notion that these price increases are the result of speculation. Speculation almost certainly has contributed to day-to-day volatility, but it can hardly be the source of the sustained rise in oil prices — and it cannot be the cause of the big increase in the price of long-dated contracts — to which I now turn.

One big difference in the market today compared to a few years ago is that long term price expectations have risen dramatically — signifying a view in the market that the supply-demand imbalance is long-term and structural, rather than short term and speculative.

The long-dated WTI price, as of the close of March 16, 2005, was over \$48.50/bbl — more than twice the average long-dated price during the 1990s. (See graph below)

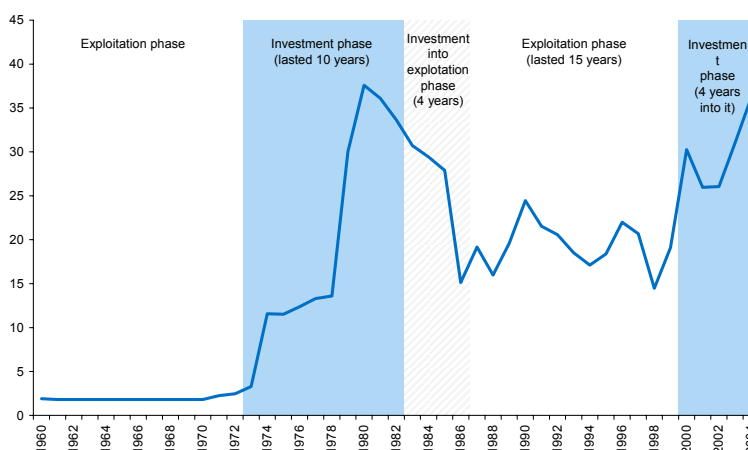


The rise in crude oil prices is likely to motivate investment across the oil supply chain—production, refining, and shipping—as underinvestment during the 1980s and 1990s relative to

current demand has left the market severely supply constrained. The rise in prices has also reflected an increase in the marginal cost of production due to higher tax burdens on producers and rising production and exploration costs. Widened quality and transportation differentials have also supported prices.

This higher cost of production has raised the price required to induce the investment necessary to build out the infrastructure base. Near term, the required increase in spending is significant. We estimate the total amount of capital spending required over the next ten years in the oil industry to meet trend demand growth at some \$2.4 trillion, nearly triple the level of spending during the 1990s.

As the graph below indicates, after a sluggish decline — which was the cause of the current capacity constraints noted above — investment has increased dramatically in the last few years. Investment in North America in 2004 increased by 30% in 2004 and 17% in 2003; however, it is expected to decelerate to 15% this year. Internationally, investment is accelerating from around 8% last year to perhaps 12% this year, in large measure due to a big pickup in Saudi Arabia, where investment should grow by around 30-40%, including a doubling of rig count. (See graph below)



One interesting feature of the oil market over the past few years has been the widening of the differential between transportation fuels (motor gasoline, diesel, and jet fuel) and heavier industrial fuels (residual fuel oil). This divergence has been driven by constraints in the refinery complex, as the petroleum market has exhausted its capability to upgrade available crude oils into transportation fuels, which are in high demand. Given the investment time required to correct this imbalance, it is likely that these wider differentials will persist in the near future.

Oil consumption in developed economies, for example both the United States and Europe, tends to be concentrated in the more expensive transportation fuels that have experienced significant price appreciation during the past few years. In contrast, developing countries, such as China, India and Latin American countries, consume heavier petroleum products, which have lagged the appreciation vis-à-vis the lighter transportation fuels. The skew of oil consumption toward heavier petroleum products in developing countries primarily reflects the higher level of manufacturing intensity in those countries. In addition, relatively lax environmental restrictions in developing

economies also leads to a higher heavier oil consumption share, while environmental constraints in developed economies skew consumption to cleaner burning fuels or alternative energy sources.

Emerging market countries such as China and India also have higher oil/GDP intensities than developed countries. An important aspect of this is that plants at early stages of industrial development are less energy efficient.

INFRASTRUCTURE

I would like now to elaborate on the question of weak Infrastructure investment.

Low investment rates in infrastructure have been a key reason for the higher energy prices we are experiencing now. The sharp rise in the energy price level that began in 2000 is the result of two decades of low investment in the global infrastructure to supply and deliver oil; this was caused by the modest rates of return on these types of investments in that period. Crude oil production, transportation and refinery output are all currently operating at record levels. As a result, the market is pushing up against capacity constraints in every aspect of the system.

One reason for optimism over the long term is that the energy industry has entered a new investment phase.

Large-scale “next-generation infrastructure” projects will be required to grow supply. The last time the industry built infrastructure on this scale was during the 1970s; that permitted years of energy demand growth at a relatively low marginal cost. This “exploitation phase” lasted for nearly two decades, however, has come to an end, as the industry has re-entered an “investment phase” that could last for the next five to ten years; it will take about that length of time before new infrastructure is sufficient to for the industry to re-enter a new lower-priced “exploitation” phase.

Our experts believe that a WTI price of at least \$30/bbl will be required to incentivize the rest of this investment phase. It will also likely be required to keep older fields cost-effective as the industry builds next generation infrastructure. Once the next-generation projects are completed, prices will likely decline as the new production displaces the older, more expensive fields that are currently supporting prices at the margin.

The total amount of capital spending required over the next ten years in the oil industry to meet trend demand growth is likely to be \$2.4 trillion, nearly triple the level of spending during the 1990s. Three main reasons explain why spending needs to be significantly higher during the 2000s than in the past: (1) a shift in government policies from subsidizing to taxing energy production, (2) the exhaustion of substantial low-cost capacity in transportation, refining and other core infrastructure, which was built in part with the help of governments during the 1970s, and (3) the acceleration of decline rates in existing production basins, requiring more capital.

Allow me to elaborate:

1. A significant shift in government policies has taken place, from subsidizing to taxing energy production and delivery through increased environmental regulations, larger royalty payments on production leases and increased taxes for both sovereign and corporate companies. We estimate that the total tax bill will likely increase by \$1.8 trillion over the next decade relative to the prior decade.

2. The exhaustion of substantial low-cost capacity in transportation, refining and other core infrastructure, which was built with the help of governments during the 1970s, requires significant investment in next-generation infrastructure. Building this infrastructure without the help of governments will require \$150 billion for transportation and \$300 billion for refining over the next ten years, including upgrading units to process increasingly poorer quality crude oil production. This spending is nearly double the level of spending that occurred during the 1990s.
3. Existing production basins are declining much faster than in the past, requiring more capital just to keep production flat. Total upstream expenditures on oil over the next ten years will likely need to exceed \$2.0 trillion to meet trend demand, and \$2.2 trillion to offset the older more expensive production, which is nearly triple the level of the previous decade.

It is important to address head on the argument that the industry is running out of oil. It is not! Higher prices result from the infrastructure being stretched.

DEPENDENCE

The Department of Energy's Energy Information Administration (EIA) predicts that the United States will become increasingly dependent on oil imports from the Middle East. Imports from this region are likely to increase from about 24 percent of total US oil imports in 2000 to about 50 percent by 2020. This level compares with the 15 percent and 23 percent of oil the US imported from that region during the 1973-1974 and 1979-1980 Middle Eastern oil crises, respectively.

As evidenced by the 1973 Arab oil embargo and the 1979 Iranian revolution, an abrupt and prolonged loss of Middle Eastern oil wreaks havoc on the U.S. economy, increasing unemployment and boosting inflation. Oil peaked at \$39 a barrel in 1981, contributing to double-digit interest rates, inflation at 9 percent, and unemployment close to 8 percent. Government actions made things even, worse as gas rationing, price controls, and the heavy hand of regulation interfered with energy markets.

Much as we are concerned about US vulnerability, that of many other nations is considerably greater. In an interdependent world, harm done to the economies of US trading partners will cause a drop in US exports and thus will feed back into the US jobs market. And it could lead to enormous social stresses in some of the more fragile nations of the developing world.

So as we develop a strategy for addressing domestic energy vulnerability, the US also needs a strategy for helping other nations to boost their energy development and intensify energy conservation. That would be a good investment in a more prosperous global economy — which helps US exporters. And by helping other nations to increase energy output and curb demand, we would be reducing the global supply/demand imbalance and thus future price pressures.

FINANCIAL VULNERABILITY

While we are on the subject of vulnerability, I thought it might be useful to add a few paragraphs — which I realize go a bit beyond the scope of this particular hearing, but are related to the Security portion of this discussion.

In an Age of Terrorism, large budget deficits and heavy dependence on foreign capital (occasioned in part by the enormous and growing US oil import bill) constitute a significant source of economic vulnerability; they increase the chances of financial turmoil in the event of another attack. Strengthening the nation's domestic and international balance sheets, in part by reducing oil imports, on the other hand, will make the US economy more resilient, frustrating attempts to undermine it through terrorism.

An attack on the US now could produce much greater financial disruption than occurred after 9/11. Before 9/11 the US had a large budget surplus. That provided flexibility to mobilize enormous sums for relief and reconstruction, economic stimulus, war in Afghanistan and homeland defense, with no adverse impact on financial markets. Foreign investor confidence and the dollar remained strong; large amounts of capital continued to flow into the US.

The next time could be a lot different. Three years of big government deficits and growing debt provide less room in the budget to respond to a new disaster. And US dependence on foreign capital has grown to record levels. Overseas investors supply the US with hundreds of billions of dollars annually; in 2004 the federal government relied on foreign central banks and investors to finance over half of its enormous deficit — and they now hold over 43% of all Treasury bonds. Many foreigners already have become skittish about buying more dollar securities; they could become much more so after a new terrorist strike.

And far greater sums could be required to respond to the next attack. Osama Bin Laden has made no secret of his desire to undermine the US economy. He has boasted that 9/11 struck the US economy “in the heart,” claiming al Qaeda spent only \$500,000 while the US lost over \$500 billion. He has proclaimed the goal of “bleeding America to the point of bankruptcy.”

Consistent with this, some intelligence experts believe that in the future al Qaeda, or other radical groups bent on terrorism, will deploy weapons of mass economic disruption rather than weapons of mass destruction. A dirty bomb attack on a major US city might kill fewer people than 9/11 but do a lot more economic damage — rendering a large portion of that city uninhabitable for decades due to radioactive contamination. That would disrupt sizeable parts of the US economy, produce massive job, insurance and business losses as well as precipitate a plunge in investor and consumer confidence. Large numbers of people subsequently could refuse to work or live in any big urban area.

A chemical, radiological or biological attack on a municipal transport system, a major port or a key rail facility would disrupt the US transportation and commuter system — and hence the overall economy — for many months. (Some buildings affected by the Fall 2001 anthrax attacks took over three years to reopen.) A radiological attack would have an impact measured in years. In an age of thin inventories and just-in-time deliveries of components and raw materials, such disruptions — particularly with respect to a large port such as Long Beach or New York/New Jersey would cause massive and prolonged dislocations throughout the entire US supply chain.

Because the US imports such large amounts of oil, such an attack on a port through which oil is imported would have a particularly disruptive impact on the US fuel supply. Regions dependent on fuel passing through the affected facility would be left with critical shortages, perhaps for a long time.

Billions of dollars would be required to respond to the medical crisis and cleanup right after an attack, many more to restore or decontaminate vital infrastructure and still more to re-stimulate the

economy. Coupled with a collapse in tax revenues due to a plummeting economy, these costs would cause an already massive budget deficit to swell.

Billions of dollars of foreign capital inflows could quickly dry up. Federal Reserve Chairman Greenspan warned last year that the enormous amount of dollars held abroad — including 70% of all foreign central bank reserves — constitutes a “concentration risk.” He noted that “a diminished appetite for adding to dollar balances must occur at some point.” By increasing the budget deficit and producing economic turmoil, a new attack would elevate fears about holding US dollar assets, potentially triggering a sudden drop in capital inflows or an abrupt withdrawal of funds. That would cause dollar to plummet and interest rates to skyrocket, further damaging an already traumatized economy.

RESPONSES TO THE ENERGY SECURITY CHALLENGE

In so far as remedies are concerned, there are a number of constructive proposals.

I was stuck by the recent report of the Energy Future Coalition that called for: the reduction of US and international dependence on oil; controlling the emissions from burning coal, oil, and natural gas that are affecting the global climate; and, extending access to modern energy services to developing countries to help them increase production and to create new markets for US energy products at the same time.

One very appealing area discussed in this report is that of providing to provide tax incentives to manufacturers and consumers to bring to the market vehicles with advance fuel saving technologies — for instance, extending the current tax law that allows businesses and individuals to claim up to \$2,000 for hybrids and other clean fuel vehicles and the tax deduction of \$4,000 for vehicles powered solely by electricity. These incentives are scheduled to be phased out by 2006. They should be extended. Large scale purchases by the Federal Government of hybrid vehicles would also make an important contribution.

The Coalition's ideas with respect to conversion of bio-mass to fuels and other products on a commercial scale deserve priority attention. So does acceleration of research and development for fuel cells and advancing the installation of infrastructure to support new transportation fuel technologies.

As in the Social Security debate, everything should be on the table: Increased use of nuclear power, increased research funds for new fuel technologies, tax incentives to encourage the use of wind, hydro and solar power; incentives to increase the use of mass transportation in major population centers; methods to change car buying habits, including allowing energy efficient cars to use HOV lanes, giving them a discount on inspection fees while hiking the inspection fees for the most inefficient vehicles, or giving them a discount on EZ Pass or related billing technologies); avoidance of regulatory or tax incentives to purchase oil inefficient SUV's.

If we need a few numbers to underscore the need to advance at home and abroad the process of developing and utilizing clean and efficient autos and fuels, the following should provide it. *Wired* magazine recently wrote the following: “Right now, there are about 800,000 cars in active use. By 2050, as cars become ubiquitous in China and India, it'll be 3.25 billion. That increase represents an almost unimaginable threat to our environment...unless cleaner, less gas hungry vehicles become the norm.” Even if *Wired's* estimates are off by half, they point out a critical issue: a dramatic

expansion of auto use will dramatically increase demand for gasoline and dramatically harm the environment – unless dramatic changes are made.

More broadly, we need to take a step back and assess the new international politics of oil due to the growing, and potentially fierce, competition for supply and the possible re-politicization of energy, e.g. the tendency for some countries to view oil — and the dependency of other nations on their oil — as a political lever or source of influence on their neighbors.

There are strong national security and national economic arguments for a more urgent drive to reduce oil dependence and to help other nations do likewise — as well as to ensure a more diversified flow of energy supplies and broadened conservation efforts around the world.